# 2017-2018 Resumes

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January 2018

Dear Friends and Prospective Employers:

On behalf of the faculty of the Department of Chemical & Biomolecular Engineering, I am pleased to introduce to you candidates for professional careers at the doctoral or post-doctoral level. Many of them will be available for employment within the next year.

Delaware is one of the leading producers of chemical engineering PhDs in the country, with more than 180 current graduate students, postdocs, and researchers in the department. The excellence of our education and scholarship is especially evident in the graduate program, which continues to be ranked as one of the top ten in the United States.

Students and faculty in the department are driving new research initiatives across the wide range of chemical engineering practice—from biomolecular engineering to energy production and sustainable chemistry. Our efforts include the launching of two USA Manufacturing Centers in the past year. NIIMBL will advance the production of some of the most important emerging pharmaceuticals, and RAPID has a major node at Delaware focused on process intensification. These two new enterprises add to the strong interdisciplinary programs of the UD-NIST Center for Neutron Science, Delaware Energy Institute, Center for Molecular and Engineering Thermodynamics, Center for Catalytic Science and Technology, and the Center for Biomanufacturing Science and Technology.

Through these efforts, as well as faculty hiring and student recruitment, we continue our work to make Chemical and Biomolecular Engineering at Delaware a premier educator of highly qualified doctoral and post-doctoral students. To learn more about these initiatives, the Department, our faculty and their research, and each of these students, I invite you to visit our web site www.che.udel.edu.

The department takes great pride in the successes and accomplishments of our students, who regularly receive awards, fellowships, and other recognitions for their research and teaching. But it is in their subsequent careers that they really come into their own. We therefore greatly appreciate your interest in their future as potential employers. We are certain that they will contribute strongly to your organizations. Please feel free to share this compilation of resumes broadly with others in your company.

The concept and format for the fourth-year research symposium originated with our graduate student organization, the Colburn Club. We are proud their leadership and are grateful for the energy and creativity they bring to our community of engineering educators, learners, and scholars.

Sincerely,

[Signature]

Eric M. Furst
Professor and Department Chair
Pratyush Agarwal
820 District Drive #207
Newark, DE 19711
Cell: (757) 272-8438
pratag@udel.edu

EDUCATION
University of Delaware, Newark, DE
Ph.D. in Chemical Engineering, August 2014 - May 2019 (expected)
Overall GPA: 3.86/4.00

Virginia Tech, Blacksburg, VA
B.S. in Chemical Engineering, summa cum laude, August 2011 - May 2014
Overall GPA: 3.96/4.00

SOFTWARE SKILLS
Python, C#, C++, C, MATLAB, Aspen Plus, Aspen HYSYS, FORTRAN, Django, HTML5

RESEARCH EXPERIENCE
Graduate Research Assistant, University of Delaware, Newark, DE, Dec. 2014 - present
Adviser: Dr. Michael T. Klein, Topic: Molecular-level Kinetic Modeling of Conventional and Unconventional Hydroprocessing Feedstocks
- Modeled multi-reactor hydroprocessing systems with several catalyst beds and interstage hydrogen quenching
- Incorporated two-phase vapor-liquid kinetics for molecular-level modeling of heavy feeds
- Developed reaction networks for heavy gas oil and triglyceride hydroprocessing
- Simulated process to perform life cycle analyses of renewable feedstocks

Adviser: Dr. John Matson, Topic: Synthesis of Thiooximes for Therapeutic H₂S Release
- Synthesized and purified thiooximes with different functional groups
- Analyzed products using NMR, GPC, and mass spectroscopy
- Studied reaction mechanisms and kinetics to determine viable reaction pathways
- Explored reactivity of thiooximes and rate of hydrogen sulfide release

Undergraduate Research Assistant, Virginia Tech, Blacksburg, VA, Jan. 2013 - May 2013
Adviser: Dr. Stephen Martin, Topic: Liquid Crystal Polymer Membranes for Gas Separation
- Synthesized and polymerized liquid crystal monomers into membranes
- Compared diffusion and permeation of different gases through membrane
- Investigated leaking problems with permeation apparatus and membrane imperfections

WORK EXPERIENCE
Engineer Intern, Aspen Technology, Bedford, MA, June - August 2016
- Developed a prototype attribute reaction model for a heavy hydrocracker in Aspen HYSYS
- Mapped the Aspen molecular characterization technology to molecular attributes
- Tuned attributes to calculate properties and kinetics of juxtaposed molecules
PUBLICATIONS AND PRESENTATIONS


LANGUAGE SKILLS

Fluent in English and Hindi
Limited working proficiency in Spanish

TEACHING EXPERIENCE

Teaching Assistant, University of Delaware, Newark, DE, Spring 2016
Course: MATH305: Applied Mathematics for Chemical Engineers
- Organize MATLAB sessions to introduce programming concepts and methods
- Create homework solutions and grade biweekly assignments

Research Mentor, University of Delaware, Newark, DE, July 2015 – present
- Train undergraduate students to use the Klein research group software suite
- Supervise undergraduate students with developing property calculation methods

HONORS

**AIChE 2014 National Student Design Competition Awards**
Safety & Health Division Award for Inherently Safer Design, 2014
SAChE Jack Wehman Design Award for Safety in Design, 2014

**Eagle Scout**, Boy Scouts of America, 2011
Peter and Phyllis Pruden Scholarship Winner, 2012
Blue Ridge Rubber Co. Scholarship Winner, 2013
William E. Poorbaugh Scholarship Winner, 2013
International Baccalaureate Diploma, 2011
National Piano Playing Auditions, National Roll, 2011
Daniel J. Beltran-Villegas, PhD
211 Lazaretto Rd. Apt 3A
Prospect Park • PA 19076
Phone 443.253.6831 • daniel.jose.beltran@gmail.com

COMPUTATIONAL RESEARCH SCIENTIST

- Detail-oriented researcher with a passion for science and discovery with a proven track record for meeting deadlines.
- Big picture thinker and team player with the ability to solve non-traditional problems over 10+ years of high-caliber science work.
- Exceptional written and verbal communication skills to access wide audiences.
- Solid computational research background in polymeric and colloidal systems with experience collaborating with experimentalists.
- Experience in using LAMMPS, HOOMD-Blue, and self-coded molecular simulators.
- Coding experience in FORTRAN, C++, Python, Bash, among others.

RESEARCH EXPERIENCE

- University of Delaware, Chemical & Biomolecular Engineering (2016-present):
  - Studied block copolymer and nanoparticle hybrid micellization with Molecular Dynamics simulations to optimize design parameters to control micelle size, shape, and nanoparticle content and location for cargo delivery and pollutant capture applications.
- University of Michigan, Chemical Engineering (2012-2016)
  - Studied anisotropic colloidal particle assembly with theory and Brownian Dynamics simulations to design reconfigurable structures for cloaking applications.
- Johns Hopkins University, Chemical & Biomolecular Engineering (2008-2012)
  - Developed predictive dynamic models of colloidal particle assembly for advanced optical applications (photons, inverse opals).
  - Studied colloidal particle dynamics and developed methodologies to directly measure forces for general colloidal applications.
- Texas A&M University, Chemical Engineering (2006-2007)
  - Studied colloidal particle distributions to measure colloidal forces for general colloidal applications by comparing experiments with Monte Carlo simulation results.
- Universidad de los Andes, Chemical Engineering (2005-2006)
  - Measured blowing agent (CFC’s, HFC’s) diffusion in polyurethane films to develop models to predict emissions from polyurethane foams.
  - Designed an impaction aerosol particle sizer for environmental measurements.

AWARDS

- Victor K. LaMer Award for outstanding PhD thesis in colloid and surface chemistry (2014)
- Paid Internship at Ozone Technical Unit (UTO), Environment Ministry, Colombia (2004-2005)
- Chemical Engineering Higher Education Quality Examination (ECAES), 5th place in Colombia (out of 1073) (2003)

LEADERSHIP AND TEACHING EXPERIENCE

- Service co-chair, Graduate Student Liaison Committee (GSLC), Johns Hopkins University (2011)
- Undergraduate degree project advising, Universidad de los Andes (2006)
- Graduate, undergraduate and high school student supervising (2008-present)
- Undergraduate Chemical Engineering Instructor, Universidad de los Andes, (2005-2006)
- Graduate Instructor, Chemical Engineering, University of Michigan (2013-2015)
EDUCATION

Ph.D. Chemical & Biomolecular Engineering Johns Hopkins University, Baltimore, MD (July 2012)
M.S. Mechanical Engineering Universidad de los Andes, Bogota, Colombia (July 2005)
B.S. Chemical Engineering Universidad de los Andes, Bogota, Colombia (March 2004)

SELECT PUBLICATIONS (OUT OF 20 PEER-REVIEWED JOURNAL ARTICLES)


References available upon request.
EDUCATION

University of Delaware · Newark, DE
Ph.D. candidate · Chemical and Biomolecular Engineering
Thesis advisor: Prof. Eleftherios T. Papoutsakis
Winter 2018 (Expected)

North Carolina State University · Raleigh, NC
B.S. · Chemical and Biomolecular Engineering
Summa cum laude · Biotechnology minor
2010 – 2013

Catawba Valley Community College · Hickory, NC
A.S. · Chemistry
2008 – 2010

RESEARCH AND WORK EXPERIENCE

Graduate Research Assistant
University of Delaware · Chemical and Biomolecular Engineering
2013 – Present
Thesis advisor: Prof. Eleftherios T. Papoutsakis
Thesis: “Engineering a Synthetic Escherichia coli Methylotroph for Conversion of Methanol to Fuels and Chemicals”
- Performing genomic modifications (gene knockouts, knockins) and regulation of gene expression (RNA interference, metabolite responsive promoters)
- Applying molecular biology techniques for recombinant protein expression and characterization (plasmid construction, protein purification, enzymatic assays)
- Improving enzymatic function using protein engineering and high-throughput screening (library construction, fluorescence activated cell sorting, sequencing)
- Operating benchtop bioreactors for controlled E. coli fermentations (bioreactor sterilization, optimization of fermentation parameters, pH, DO monitoring)

Undergraduate Research Assistant
North Carolina State University · Chemical and Biomolecular Engineering
2012 – 2013
Advisor: Prof. Robert M. Kelly
- Performed recombinant enzyme purification and characterization (protein chromatography, immunoblot analysis, enzymatic assays)
- Cultured hyperthermophilic organisms for degradation of lignocellulosic biomass and production of fuels and chemicals

Special Metals Welding Products Company
A Precision Castparts Corporation Company · Newton, NC
2011
- Full-time summer internship as a process engineer
- Contributed to the review and improvement of ultrasonic cleaning processes
- Performed tensile testing on wire specimens for process improvement

TEACHING EXPERIENCE

Graduate Teaching Assistant
University of Delaware · Chemical and Biomolecular Engineering
2015
Instructor: Prof. Prasad Dhurjati
- Advised undergraduate seniors participating in Chemical Engineering Laboratory II, Fermentation and Bioseparation experiment
- Responsible for teaching bioreactor operation, microfiltration and ion-exchange chromatography to purify proteins upon complete fermentation

Undergraduate Teaching Assistant
North Carolina State University · Chemical and Biomolecular Engineering
2013
Instructor: Prof. Robert M. Kelly
- Advised undergraduate seniors participating in Protein Purification Laboratory
- Responsible for teaching protein liquid chromatography and enzyme kinetics to purify and assay thermophilic enzymes

PUBLICATIONS AND PATENTS


**PRESENTATIONS**


**HONORS AND AWARDS**

- Robert L. Pigford Teaching Assistant Award · *UD* 2016
- Dean’s List · *NCSU* 2010 – 2013
- College of Engineering Scholarship · *NCSU* 2010 – 2012
- Excellence in Organic Chemistry Award · *CVCC* 2010
- High Honor Graduate · *CVCC* 2010
- Rotaract Club Scholarship · *CVCC* 2008 – 2010

**ORGANIZATIONS AND OUTREACH**

- Graduate Recruiting Volunteer · *UD* 2015, 2016
- American Institute of Chemical Engineers 2010 – 2017
- Society for Biological Engineering 2016 – 2017
- Golden Key International Honour Society 2012 – 2013
- Gainesville State College Annual Mathematics Tournament 2009, 2010
- Rotaract Club 2008 – 2010
(Lily) Ziwei Cheng
326 Stamford Dr., Newark, DE 19711
Phone: (302)-290-2989, Email: lzcheng@udel.edu

CAREER OBJECTIVE
To use my research skills for developing new products and technologies that benefit the society. Work in a team driven setting to continue building my character on leadership and collaboration while learning about new areas of interest.

SUMMARY
Four years’ experience in material characterization and reactor operations.

EDUCATION
Ph.D. Candidate (Chemical Engineering), University of Delaware, Newark, DE 2014-Present
Advisor: Prof. Dionisios G. Vlachos GPA: 3.25/4.00

B.S. (Chemical and Engineering), Georgia Institute of Technology, Atlanta, GA 2011-5/2014
Advisor: Prof. Charles A. Eckert GPA: 3.70/4.00

RESEARCH EXPERIENCE
Graduate Research Assistant, University of Delaware, Newark, DE 2014-Present
Thesis project: Structural Characterization of Fructose-derived Humins
  ● Study the effect of solvent properties on humins dissolution
  ● Develop analytical methods to determine the molecular weights present in the organic-soluble fraction
  ● Understand the macromolecular structure of humins

Thesis project: Catalytic Hydrotreatment of Humins (In progress)
  ● Convert humins to valuable chemicals through catalytic hydrotreatment
  ● Optimize the reaction conditions to achieve high oil yield and conversion

Thesis project: Formation and Growth Mechanism of Fructose-derived Humins (In progress)
  ● Measure the particle size, growth rate and morphology of humins forming in an aqueous acidic fructose solution using X-ray and dynamic light scattering

Undergraduate Research Assistant, Georgia Institute of Technology, Atlanta, GA 2011-2014
Project: Suzuki Coupling of Basic Nitrogen-containing Substrates
  ● Optimize the reaction conditions for the best yield

TEACHING EXPERIENCE
Teaching Assistant, Topics in Energy and the Environment Fall 2017
  ● Grade essays and provide personalized feedback for 20 students
  ● Judge oral presentations

Teaching Assistant, Introduction to Chemical Engineering Spring 2017
  ● Facilitate in-class discussions for 120 students
  ● Hold weekly office hours
  ● Grade quizzes and homework

PUBLICATIONS


7. Senter, C; Rumple, A; Medina-Ramos, W; Houle, D; Cheng, Z; Gelbaum, C; Fisk, J; Holden, B; Pollet, P; Eckert, C.A. *The Effects of CO₂ Pressure and pH on the Suzuki Coupling of Basic Nitrogen Containing Substrates*, Organic & Biomolecular Chemistry, 2014, 12 (38), pp 7598-7602

**INSTRUMENT EXPERIENCE**

- Laboratory batch reactor operations
- Analytical methods development
- Column/thin-layer chromatography
- Liquid Chromatography (HPLC, GPC)
- Gas Chromatography (GC-FID/TCD)
- Mass Spectrometry (LC/MS, GC/MS, ESI-MS, MALDI)
- Mass Spectrometry
- Small angle neutron/X-ray scattering, XRD
- Light scattering (SLS, DLS)
- SOP and proposal writing
- BET surface area analysis
- FT-IR, NMR, UV-Vis, Elemental analysis
- TGA, DSC
- Titration
- AspenPlus, MATLAB, IgorPro, Minitab
- OriginLab, Microsoft Office

**PRESENTATIONS**

- **Catalytic Hydrotreatment of Humins in Methanol over a Rh/C Catalyst**
  - Poster presentation, Catalysis Club of Philadelphia Annual Student Poster Contest
  - November 2017

- **Structural Analysis of Humins Formed in the Brønsted-Catalyzed Dehydration of Fructose**
  - Oral presentation, AIChE Annual Meeting
  - November 2017

- **Structural Analysis of Humins Formed in the Brønsted-Catalyzed Dehydration of Fructose**
  - Poster presentation, North American Catalysis Society Meeting
  - June 2017

**ACCEPTED PROPOSALS**

- **Mechanistic Study of Humins Formation and Growth**
  - Cheng, Z.; Vlachos, D. G., Argonne National Lab APS Proposal ID# 50977, 2 days on Ultra Small Angle X-ray Scattering Instrument
  - February 2017

**AWARDS**

- Thomas L. Gossage International Enrichment Scholarship
  - 2013
- Educational Testing Service TOEFL Scholarship
  - 2011

**ORGANIZATIONAL POSITIONS**

- Vice president at Georgia Tech Ballroom Dance Club
  - 2014

**VOLUNTEERING AND PUBLIC SERVICE**

- Mentor with Georgia Tech Alumni Association
  - 2014-2015
- Mentor with Georgia Tech Freshmen Seminar Course
  - 2012-2013
Chen-Yu Chou
Phone: +1 302-561-3168 | E-Mail: cychou@udel.edu

EDUCATION

University of Delaware, Newark, DE, USA
Ph.D. Candidate, Chemical and Biomolecular Engineering, Advisor: Prof. Raul F. Lobo 8/2014 – present

National Taiwan University (NTU), Taipei, Taiwan
M.S., Chemical Engineering, Advisor: Prof. Kuo-Chuan Ho 2009 - 2011
B.S., Chemical Engineering 2005 - 2009

RESEARCH EXPERIENCE

Graduate Research Assistant 12/2014 - present
Center for Catalytic Science & Technology; Department of Chemical and Biomolecular Engineering, University of Delaware
- Synthesize and characterize indium oxide and Cu-based catalysts and investigate their catalytic activities in a high-pressure flow reactor system for the direct conversion of CO₂ to methanol.
- Investigate the catalytic mechanism and kinetic behavior of cost-effective Fe-based catalysts for the reverse water-gas shift reaction.

Research Assistant 2013 - 2014
Interfacial Phenomena Laboratory, NTU
- Synthesized and modified silica nanocomposite films by sol-gel and self-assembly techniques.

Graduate Research Assistant 2009 - 2011
Electro-Optical Materials Laboratory, NTU
- Enhanced power conversion efficiency of CdS quantum dot-sensitized solar cells (QDSSC) 47% by engineering TiO₂ films with micro/nano-composite pores in the photoanodes.
- Established a hybrid ZnO nanostructured (nanowire and nanoparticle) system for QDSSC and characterized system properties via optical and electrochemical analyses.

Undergraduate Research Assistant 2008 - 2009
Energy Materials Laboratory, NTU
- Synthesized spherical FePO₄ as a precursor to cathode material for high power density Li-ion batteries.

SKILLS AND PROFICIENCIES

Analytical and Characterization Techniques: Mass spectroscopy, Gas chromatography, Ultraviolet visible spectrophotometry, Raman spectroscopy, Scanning electron microscopy with elemental analysis, X-ray diffraction, X-ray photoelectron spectroscopy, X-ray fluorescence, Temperature-programmed reduction/oxidation, Electrochemical device testing


INDUSTRIAL AND TEACHING EXPERIENCE

Teaching Assistant at University of Delaware 2017, Spring 2016
- Two semesters: Special Topics in Energy and Chemical Engineering Thermodynamics

Product Representative 2013
Chang Chun Petrochemical Co., Ltd. (Chemical company with annual revenue over $5B), Taiwan
- Administered Polyvinyl butyral interlayer services and solutions including sales and marketing strategies to local distributor and international chemical companies (e.g. BASF, Dow Chemical Company, PPG Industries).

HONORS AND AWARDS

- Taipei Film and Drama Business Union Scholarship for Outstanding Students (3-time winner) 2008 - 2010
- National Science Council Grant for Graduate Students in Taiwan 2009
- Research Assistant Fellowship from Industrial Technology Research Institute (ITRI, Taiwan) 2008 - 2009
PUBLICATIONS

Peer-reviewed Journals


SELECTED PRESENTATIONS

OBJECTIVE: To leverage my background in microbial metabolism and metabolic engineering to address global challenges in sustainable chemistry and agriculture.

EDUCATION

Ph.D. Candidate, Chemical and Biomolecular Engineering
University of Delaware 2014 – present
B.S. Chemical Engineering, Honors Program
Stanford University 2009 – 2013

RESEARCH EXPERIENCE

Doctoral Researcher, University of Delaware
Advisor: Professor Maciek Antoniewicz, Chemical and Biomolecular Engineering

- **Thesis:** Engineering nitrogen self-sufficient cocultures through adaptive evolution
- Performed design of experiments to identify optimal growth conditions for the nitrogen-fixing microbe, *Azotobacter vinelandii* in aerobic batch culture.
- Constructed and validated metabolic network model for *A. vinelandii*. Performed the first instance of 13C-metabolic flux analysis (13C-MFA) of an aerobic diazotroph.
- Systematically designed and characterized an array of nitrogen self-sufficient cocultures involving *A. vinelandii* paired with various strains of cyanobacteria and *E. coli* capable of secreting carbon substrates.
- Perform adaptive laboratory evolution to identify key traits that enable synthetic symbiosis

U.S. Fulbright Fellow, International Rice Research Institute
Advisor: Dr. Inez Slamet-Loedin, Plant Breeding, Genetics, and Biotechnology

- **Objective:** Development of iron-fortified, cisgenic indica rice with Genetic Transformation Lab (GTL)
- Streamlined high-throughput assay to quantify iron content in rice endosperm.
- Quantified effect of drought, salinity, and elevated CO2 on grain nutrition via ICP-OES to assess implications of climate change on biofortification.
- Developed public communications pieces on rice biofortification for IRRI’s Healthier Rice campaign.

Undergraduate Honors Research Assistant, Stanford University
Advisor: Professor Elizabeth Sattely, Chemical Engineering

- **Thesis:** Metabolism of dietary, anticancer glucosinolates by the gut microbe, *Bacteroides thetaiotaomicron*, and implications for human health
- Designed and implemented high-throughput screen of a transposon mutant library containing >7500 clones.
- Identified minimum cluster of microbial genes required to metabolize target plant anticancer compounds.

AWARDS

- Professional Development Award, University of Delaware April 2016, 2017
- NSF Graduate Research Fellowship Program, Honorable Mention April 2015, 2016
- Pigford Award, Dept. of Chemical and Biomolecular Engineering, University of Delaware Aug 2014
- U.S. Fulbright Research Fellowship, Philippines Nov 2013
- Bio-X Post-Baccalaureate Research Fellowship, Stanford June 2013
- Honors Research Award in Chemical Engineering, Stanford May 2013
- American Inst. of Chemical Engineers Distinguished Service Award, Stanford May 2013
- **Second Place**, Oral Research Presentation, AIChE Western Regionals Conference, San Diego April 2013
- BP America Engineering Scholarship Sept 2012, 2011
- Stanford Vice Provost for Undergraduate Education, Research Fellowship June 2012, 2011
- **First Place**, Dhaka Water Initiative, Stanford BASES 150K Social Entrepreneurship Challenge May 2012
  Team: Engineers for a Sustainable World
SELECT ORAL PRESENTATIONS


6. Diaz CAC, Klein AP and Sattely ES. (April 2013). “Activation of plant anticancer compounds by the gut microbiota: Metabolism of glucosinolates by Bacteroides thetaiotaomicron and implications for human health.” Second Place, Research Paper Competition, American Institute of Chemical Engineers (AIChE) Western Regionsals Conference, San Diego, USA.

SELECT POSTER PRESENTATIONS:


TEACHING EXPERIENCE

Teaching Assistant for Thermodynamics Unit, Chemical Engineering Laboratory I Spring 2016

MENTORING EXPERIENCE

Nathaniel Hamaker, PhD Rotation Student, Chemical Biology Interface Program Jan – March 2017

Project: “Harnessing cyanobacterial metabolism towards engineering carbon self-sufficient co-cultures.”

LEADERSHIP AND SERVICE AT UNIVERSITY OF DELAWARE

Chair and previously Co-Chair, Graduate Women In Engineering May 2016 – present

President, Graduate Student Body, Dept. of Chemical and Biomolecular Engineering Sept 2016 – Sept 2017

Industry Liaison, Graduate Student Body, Dept. of Chemical and Biomolecular Engineering Sept 2014 – present

Graduate Representative, Graduate Diversity Committee, College of Engineering January 2017 – present

Founding Member, Colburn Club STEM Outreach Program March 2015 – present

SKILLS

• Metabolic network construction, isotopic labeling experiment design, and 13C flux analysis to characterize metabolism.
• Adaptive laboratory evolution. Systems-level analysis of heterogeneous populations.
• Transposon mutagenesis and high-throughput screening of mutant libraries.
• Design of experiments. Microbial cell culture. Characterization of cell biomass composition and overall physiology.
• GC-MS, LC-MS, ICP-OES to identify and quantify microbial and plant metabolites.
• Derivatization and spectrofluorometric detection of target compounds.
• Comparative genomics to identify candidate genes responsible for desired enzymatic activity.
• Molecular biology and recombinant DNA techniques in microbial and plant hosts.
EDUCATION

University of Delaware, Newark DE
PhD Candidate in Chemical & Biomolecular Engr, Sept 2014- 4Q2018/1Q2019 (expected)

- Cumulative GPA: 4.00/4
- Thesis: Towards Predictive Models of Antibody Biophysical Properties and Aggregation
- Advisor: Chris J. Roberts

Massachusetts Institute of Technology David H. Koch School of Chemical Engineering Practice, Cambridge MA
MS in Chemical Engineering Practice, September 2010

- Cumulative GPA: 4.64/5

Tufts University School of Engineering, Medford MA
BS in Chemical Engineering, May 2009

- Graduated Summa Cum Laude with high thesis honors
- Cumulative GPA: 3.80/4, GPA in major: 3.94/4

RESEARCH AND WORK EXPERIENCE

University of Delaware, Newark, DE
Graduate Research Assistant, September 2014-Present

- Investigate role of monoclonal antibody protein-protein interactions and unfolding thermodynamics in aggregation rates and mechanism
- Evaluated long-term monoclonal antibody non-native aggregation as a function of solution conditions at pharmaceutically relevant conditions.
- Used Molecular Dynamic & Monte Carlo Simulations to predict biophysical properties
- Tuned coarse-grained molecular models to prediction experimental protein-protein interactions quantitatively
- Advised undergraduate student in evaluation Hofmeister salts on protein stability

Bristol-Myers Squibb, New Brunswick, NJ
Research Scientist, Late Phase Chemical Development, May 2013-September 2014

- Researched, developed, and implemented organic processes (chemical reaction, crystallization, purification, etc.) to supply active pharmaceutical ingredient (API) and process knowledge for BMS drug pipeline
- Lead for pilot plant activities, and prepared cGMP documentation
- Represented the chemical development in program-focused cross-functional teams to achieve goals including: campaign sizing/scheduling for clinical material requirements, developing target API powder properties for formulations
- Scaled-up production for glass-plants (1-10kg) and pilot plants (10-500kg)
- Collaborated with drug product colleagues to balance desired API powder properties against process throughput optimization

Associate Research Scientist, Late Phase Chemical Development, Sept 2010-May 2013

- Optimized organic chemical processes for quality, yield, process robustness, cycle time, and safety using sound laboratory development, plant data, experience, and process analytical technology (PAT)
- Managed undergraduate intern to create crystallization seed evaluation workflow
- Created and executed Design of Experiments (DoE) to elucidate several unit operations
- Utilized multivariate analysis and visualization to data using MATLAB and JMP
- Modeled and developed multi-dimensional design space for a liquid-liquid extraction unit operation to ensure API quality and minimize yield loss
MIT School of Chemical Engineering Practice, Cambridge, MA

**Emissions Control of Halogenated VOCs by Activated Carbon Adsorption, June 2010**
Novartis Pharmaceutical, East Hanover, NJ
  - Designed carbon adsorption column allowing use of chlorinated VOCs at pilot plant scale using experiments and MATLAB modeling

**Removal of Soluble Palladium and Iron by Fixed-Bed Adsorption, July 2010**
Novartis Pharmaceutical, East Hanover, NJ
  - Led team to remove spent catalyst metals from pharmaceutical intermediate solution

**Evaluation of Spray Processes for Production of Fluoride Phosphors, August 2010**
Cabot Corporation, Albuquerque, NM
  - Used DoE to minimized HF production and maximize brightness of fluoride IR-upconverting phosphors for covert taggant security applications

**Tufts University Senior Thesis with High Honors, Medford, MA**

**Cobalt and Iron Nanocrystals as Combustion Catalyst for Propulsion Applications, 2008-2009**
Advisor: Maria Flytzani-Stephanopoulos
  - Developed and tested nanoscale oxidation catalysts for jet propulsion applications

**Tufts University Senior Project, Medford, MA**

**Biodiesel Production and Purification, 2008-2009**
  - Performed bench scale and scale up experiments for biodiesel production

**Holcim (US) Inc, Waltham, MA**

**Environmental Engineering Internship, Summer 2008**
  - Recommended process refinements & altern. fuels to reduce cement plants emissions

**UMass Medical School, Worcester, MA**

**Internship in Tariq Rana Lab: P-TEFb complex role in HIV replication, Summer 2006**
  - Cultured E. Coli, HeLa, and insect cells for protein expression and purification

**Lab Assistant in Michael Czech Lab, Summer 2005**
  - Molecular biology research related to diabetes associated GLUT proteins

**SELECT PUBLICATIONS, PRESENTATIONS, AND PATENTS**


Si, R.; Ricks B.; Boucher M.; Zhai Y.; Gittleson F.; Ferreira G.; Saltsburg H.; Flytzani-Stephanopoulos M. Shape Effect of Nanoscale Oxides Used as Metal Supports in Redox Catalysis, AIChE Annual Meeting, Nashville, TN, November 2009.
Thomas E. Gartner III  
1121 S. 13th St, Philadelphia PA, 19147 • 707-363-7746 • tgartner@udel.edu

EDUCATION

University of Delaware  
Ph.D. in Chemical & Biomolecular Engineering (2019 expected)  
August 2014-Present  
GPA: 4.0/4.0

University of California, Berkeley  
Bachelor of Science with Honors in Chemical & Biomolecular Engineering  
August 2007-May 2011  
GPA: 3.71/4.0

HONORS AND AWARDS

1st Place, Materials Engineering and Sciences Division Graduate Student Poster Competition, AIChE 2017 Annual Meeting  
2017

Honorable Mention, NSF Graduate Research Fellowship Program  
2015

Paul H. Schipper Fellowship, University of Delaware  
2015

Qualifying Exam Commendation, University of Delaware Department of Chemical & Biomolecular Engineering  
2015

Graduate Coursework Commendation, University of Delaware Department of Chemical & Biomolecular Engineering  
2015

Robert L. Pigford Fellowship, University of Delaware  
2014

President’s Quality Award, Applied Materials, Inc.  
2012

Alumni Scholar Leadership Award, UC Berkeley Alumni Association  
2007-2011

National Merit Scholar  
2007

PUBLICATIONS AND PATENTS


PRESENTATIONS

1. T.E. Gartner, III, A. Jayaraman, Solvent effects on the structure and thermodynamics of polymer blends with varying architectures, (Talk) AIChE Annual Meeting 2017


5. T.E. Gartner, III, C.K. Shelton, M.A. Morris, A. Jayaraman, T.H. Epps, III, Salt distribution, domain spacing, and interfacial characteristics in lithium ion-doped block polymer electrolyte films, (Talk) APS March Meeting 2017


**ACADEMIC AND PROFESSIONAL RESEARCH EXPERIENCE**

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<thead>
<tr>
<th>University of Delaware</th>
<th>Newark, DE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ph.D. Student, Department of Chemical &amp; Biomolecular Engineering</strong> (August 2014-Present)</td>
<td></td>
</tr>
<tr>
<td>- Develop and apply computational (molecular dynamics and Monte Carlo simulation) and theoretical (PRISM theory) techniques to study the thermodynamic and structural implications of solvent processing of polymer and bio-inspired colloidal materials</td>
<td></td>
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<tr>
<td>- Link macromolecular design characteristics and processing conditions to soft materials self-assembly</td>
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<tr>
<td>- Collaborate closely with experimentalists to inform and validate computational approaches</td>
<td></td>
</tr>
<tr>
<td>- Apply X-ray and neutron reflectometry to characterize effective interactions and structure in lithium salt-doped block polymer electrolyte materials</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Applied Materials, Inc.</th>
<th>Sunnyvale, CA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chemical-Mechanical Planarization (CMP) Process Engineer</strong> (June 2011-July 2014)</td>
<td></td>
</tr>
<tr>
<td>- Performed process development R&amp;D for microelectronic device fabrication</td>
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<tr>
<td>- Developed CMP processes for the fabrication of through-silicon-vias</td>
<td></td>
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<tr>
<td>- Undertook study of wafer-pad friction and tribology during CMP</td>
<td></td>
</tr>
<tr>
<td>- Identified sources of and methods for reducing scratch and defect generation in Copper CMP</td>
<td></td>
</tr>
<tr>
<td>- Integrated new materials in Back-End-of-Line interconnect formation (Co, Ru, Mn)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lawrence Berkeley National Laboratory</th>
<th>Berkeley, CA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student Research Assistant, Superconducting Magnet Group</strong> (May 2010-May 2011)</td>
<td></td>
</tr>
<tr>
<td>- Electrical characterization of superconductors in cryogenic and magnetic environments</td>
<td></td>
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<tr>
<td>- Tracked oxidation of superconducting materials during heat treatment</td>
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<tr>
<td>- Probed mechanical deformation and damage to the superconducting wire during magnet fabrication using optical and scanning-electron microscopy</td>
<td></td>
</tr>
</tbody>
</table>

**TEACHING AND OUTREACH EXPERIENCE**

<table>
<thead>
<tr>
<th>University of Delaware Colburn Club Outreach Group</th>
<th>Newark, DE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outreach Coordinator</strong> (9/2015-9/2016); <strong>Member</strong> (3/2015-9/2015, 9/2016-Present)</td>
<td></td>
</tr>
<tr>
<td>- Founding member of a UD chemical engineering student group devoted to science outreach</td>
<td></td>
</tr>
<tr>
<td>- Developed and executed original science and engineering demonstrations at a local middle school</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>University of Delaware Department of Chemical &amp; Biomolecular Engineering</th>
<th>Newark, DE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teaching Assistant</strong> (February 2016-December 2016)</td>
<td></td>
</tr>
<tr>
<td>- Undergraduate Thermodynamics II (Spring 2016); Average TA evaluation score: 4.91/5.0</td>
<td></td>
</tr>
<tr>
<td>- Introduction to Polymer Science and Engineering (Fall 2016); Average TA evaluation score: 4.91/5.0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>University of California Marching Band</th>
<th>Berkeley, CA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student Director</strong> (December 2009-May 2011)</td>
<td></td>
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<tr>
<td>- Cooperated with other Executive Committee members to set and enforce policy for 230-member band</td>
<td></td>
</tr>
<tr>
<td>- Planned and led musical rehearsals in preparation for major performances</td>
<td></td>
</tr>
</tbody>
</table>

**SKILLS**

- Simulation & Theory Techniques: Coarse-grained molecular dynamics and Monte Carlo simulations, PRISM theory, umbrella sampling, weighted histogram analysis method, Gibbs ensemble
- Characterization Methods: Neutron and X-ray scattering (small-angle and reflectometry), scanning and transmission electron microscopy, optical microscopy, atomic-force microscopy, profilometry, spectral reflectometry, NMR
- Clean room procedures; laboratory, chemical, laser, vacuum, and cryogenic safety procedures
Andrew S. Gaynor

Chemical and Biomolecular Engineering
University of Delaware
Email: agaynor@udel.edu

Colburn Laboratory Office #361
150 Academy Street
Newark, DE 19716

Education

University of Delaware, Newark, DE
Fall 2014-Present
Candidate for Doctor of Philosophy
Chemical and Biomolecular Engineering

Tulane University, New Orleans, LA
Fall 2010-Spring 2014
Bachelor of Science Engineering in Chemical and Biomolecular Engineering, Summa Cum Laude
Bachelor of Science in Cell and Molecular Biology and Jewish Studies, Summa Cum Laude
GPA: 3.91/4.0

Research Experience

University of Delaware, Newark, DE
Summer 2015-Present
Graduate Research Assistant
Advisor: Prof. Wilfred Chen
• Exploring the use of prodrug converting enzymes to treat cancer
• Developing novel techniques for modulating intracellular protein concertation via controlled
  protein degradation
• Constructing Boolean logic gates from protein components at the post-transcriptional level
• Designing autonomous, responsive protein circuits that respond to endogenous cancerous cues to
  treat diseased cells

Tulane University, New Orleans, LA
Fall 2011-Spring 2014
Undergraduate Research Assistant
Advisor: Prof. Kim O’Connor
• Examined the effects of mesenchymal stem cell surface markers on their differentiation potential
• Developed methods for sorting heterologous mesenchymal stem cells populations based on
  differentiation potential
• Senior Honors Thesis: Differentiation and Proliferation Characterization of Senescent
  Mesenchymal Stem Cells

Massachusetts Institute of Technology, Cambridge, MA
Summer 2013
Amgen Scholars Research Intern
Advisor: Prof. Angelika Amon
• Investigated the link between aneuploidy and growth rate in S. cerevisiae
• Analyzed microscopy images to determine time spent in each cell cycle phase

Publications


**Presentations**


**Laboratory Skills**

• **Molecular Cloning**: polymerase chain reaction, primer design, construct generation, site-directed mutagenesis, colony screening

• **Bacterial Culture**: protein expression and purification, plasmid DNA preparation

• **Mammalian Cell Culture and Analysis**: aseptic technique, HeLa and HEK cell lines, fluorescent microscopy, cell viability assays, western blot

• **Microscope Image Analysis**: Axiovision, ImageJ

**Awards**

• Fraser and Shirley Russell **Teaching Fellowship** (Spring 2018)

• Robert L. Pigford **Teaching Assistant Award** (Spring 2017)

• *N.S.F. Graduate Research Fellowship Program* Honorable Mention (2015 & 2016)

• *N.I.H. Chemical-Biology Interface* Training Fellowship (Spring 2015)

**Leadership and Communication Experience**

• **Chen Laboratory Manager** (Fall 2017-Present)

• **Teaching Assistant** for Metabolic Engineering (Fall 2016) and Introduction to Chemical Engineering (Spring 2016)

• **Colburn Outreach Club** performing outreach to local middle school to foster interest in science and engineering and providing supplemental algebra support (Fall 2015-Present)

• **Young Engineers’ Camp** run by University of Delaware College of Engineering to allow local youth to explore engineering (Summer of 2015 & 2016)
Navid Ghadipasha

Contact Information
Nghadi@udel.edu
225-3262229

Address
118 East Park Pl
Newark, DE 19711

EDUCATION

**Louisiana State University**, Baton Rouge, LA  
PhD, Chemical Engineering, **GPA: 3.7**  
Master of Science, Chemical Engineering  
Process System Engineering Group  
August 2017

**Technical University of Dortmund**, Dortmund, Germany  
Studied at TU Dortmund for intensive German language program  
October 2011 to June 2012

**Sharif University of Technology**, Tehran, Iran  
Bachelor of Engineering, Chemical and Petroleum Engineering  
May 2011

CAREER HISTORY & ACCOMPLISHMENT

**Post-Doctoral Researcher**  
Chemical Engineering Department, University of Delaware  
August 2017-Present

- Modelling and Analysis of Biological Systems

**Tulane University – Fluence Analytics, Inc.**, New Orleans, LA  
August 2014 to March 2017

*LSU-Tulane-APMT Research Collaboration*

- Winner of the Model-Based Innovation Prize for the best published paper describing the use of gPROMS family products in a novel area of technology (2016)
- Collaboration between engineers and university researchers in joint project
- Developed an online engineering-based framework for optimal operation and control of polymerization processes
- Research on building next-generation polymers and tools to accelerate cost-effective commercial production under the Smart Material Design, Analysis and Processing (SMATDAP) Consortium

**Louisiana State University**, Baton Rouge, LA  
August 2012 to August 2017

*Graduate Research Assistant, Cain department of Chemical Engineering*

- Developed a novel image-based technique for analysis and monitoring of crystallization systems based on neural network modelling
- Created a real-time framework for control and monitoring of crystal size distribution in highly suspended system
- Performed lab experiments and analyses to provide data for structural study of crystals
- Identified and developed advanced control systems such as model predictive controller (MPC) to improve operations and profitability of polymerization systems
- Performed quantitative analysis of the product qualities by examination of large datasets using Artificial neural networks modelling
SELECTED PUBLICATIONS

1. “Online control of crystal properties in non-isothermal antisolvent crystallization”, *AIChE* J. 61 (7) 2188-2201, (July 2015)


5. “A Robust Model-based Control Approach for Online Optimal Feedback Control of Polymerization Reactors-Application to Polymerization of Acrylamide-Water-Potassium Persulfate (KPS) System”, *Chemical Engineering Transactions*, 2017, 57, pp 1105-1110


SELECTED CONFERENCE PRESENTATIONS


SKILLS

*Computer*: MATLAB, Python, COMSOL, gPROMS, LabVIEW, Simulink

*Language*: Farsi (native), German (intermediate), English (Fluent)
EDUCATION

University of Delaware – PhD candidate in Chemical and Biomolecular Engineering, Advisor: Dr. Bingjun Xu
- Project: Develop spectroscopic characterization techniques to study the influence of solvent on catalyst active sites, reaction mechanisms, and product distributions.
- GPA: 3.90

Cornell University, Ithaca, NY – Bachelors of Science in Chemical and Biomolecular Engineering, 2014
- GPA: 3.71, graduated cum laude

RESEARCH AND WORK EXPERIENCE

University of Delaware
PhD Candidate – Bingjun Xu Group
- Jan. 2015 - present
- Designed and optimized an Attenuated Total Reflection Fourier Transform Infrared Spectroscopy (ATR-FTIR) cell for studying solvent effects on zeolites. Successful applications:
  - Developed a method to quantify adsorbed probe molecules on zeolite surfaces in liquid phase FTIR.
  - Implemented quantitative method to characterize how solvent choice affects diffusion in zeolite micropores.
  - Developed a method for temperature programmed desorption (TPD) in liquid phase FTIR.
- Characterization of zeolite and metal catalysts in transmission (vacuum) FTIR via probe molecule adsorption (CO, pyridine, methylated pyridines, deuterated acetonitrile) and TPD.
- Quantification of Brønsted acid sites in a gas phase flow reactor using propylamine decomposition as a test reaction.
- Used batch reactors for liquid phase catalytic activity tests of samples characterized via ATR-FTIR.

University of Delaware
Laboratory safety manager – Xu Group
- Jan. 2016 - present
- Prepare laboratories for professional inspection three times annually.
- Responsible for enforcing safe laboratory practices and minimizing risks.

United States Department of Energy
Science Writer
- Aug. 2016 – Aug. 2017
- Published outreach articles aimed at describing complex scientific publications to a general audience.
  - “Fight to the Top: Silver and Gold Compete for the Surface of a Bimetallic Solid.” The article focused on the importance of operando and in-situ catalyst characterization in the context of a nanoporous gold alloy that continually changed structure in different contacting environments.
  - “Clean and Green! Everyday Products Made from Sugar.” The article focused on surfactant applications in modern life, surfactant structure-function relationships, and a route to produce them from biomass.
- Edited articles and provided feedback to other writers at the D.O.E.

Publications


**Honors and Awards**
2) Robert L. Pigford Teaching award
3) Kokes travel award – North American Meeting (NAM) 2017

**TEACHING EXPERIENCE**

**Graduate Teaching Assistant** 2015-2016

Teaching Assistant – Fluid Mechanics (Fall 2015) and Chemical Kinetics and Reactor Design (Fall 2016)
- Facilitated an optional discussion section for students – focus on encouraging student interaction and discussion.
- Reviewed and summarized the material covered every week for the students.

**Cornell Learning Strategies Center (LSC)** 2014

Head Teaching Assistant – Pre-freshman Summer Program (PSP)
- Trained course TAs facilitation skills for discussion sections.
  - Focus on reducing amount TA speaks and increasing student participation.
  - Trained TAs to ask leading questions instead of explaining logic outright.
- Mentored students from disadvantaged backgrounds new to Cornell.

**EXPERIMENTAL SKILLS**
- Fourier Transform Infrared Spectroscopy (FTIR)
  - Transmission FTIR (in-vacuo)
  - ATR-FTIR
- Batch and continuous flow reactor design
- Catalytic activity testing (batch and continuous flow)
- Gas Chromatography and Mass Spectrometry
- X-Ray Diffraction (XRD)

**COMPUTER SKILLS**
- Density functional theory calculations (DFT)
- MATLAB
- Microsoft Office
- Mathematica
- Materials Studio
- Aspen
Amber M. Hilderbrand

Chemical and Biomolecular Engineering
University of Delaware
150 Academy Street, Colburn Laboratory Office #219, Newark, DE 19711

EDUCATION:
University of Delaware, Newark, DE
Fall 2013-Present
Candidate for Doctor of Philosophy
Chemical and Biomolecular Engineering
Cumulative GPA: 3.64/4.00

Iowa State University, Ames, IA
Fall 2009-Spring 2013
Bachelors of Science in Chemical Engineering, Cum Laude
Chemical and Biological Engineering
Cumulative GPA: 3.41/4.00

RESEARCH EXPERIENCE:
University of Delaware, Newark, DE
August 2013-Present
Graduate Research Assistant
Advisor: Dr. April M. Kloxin
• Establishing a three-dimensional (3D), hydrogel-based culture system that incorporates collagen mimic peptides (CMPs) to impart fibrillar structure over multiple length scales
• Designing and characterizing CMPs to promote self-assembly from triple helices to fibrils in solution
• Determining mechanical properties of hydrogel-based materials with covalently incorporated CMPs using rheology

Iowa State University, Ames, IA
August 2012-August 2013
Undergraduate Research Assistant
Advisor: Dr. Kaitlin Bratlie
• Induced polarization of Tumor Associated Macrophages using interleukin-4 and lipopolysaccharide and incubated with functionalized polystyrene particles to reverse polarization
• Performed various biochemical assays to determine extent of cell repolarization
  o Determined that particles did not change phenotype, but induced changes in expression of pro- or anti-inflammatory markers

RESEARCH SKILLS:
Peptide and protein characterization: Reverse-phase HPLC, mass spectrometry (ESI, LC-MS), circular dichroism (CD), Transmission Electron Microscopy (TEM), Atomic Force Microscopy (AFM), UV-Vis spectroscopy, dynamic light scattering (DLS), small angle neutron scattering (SANS)
Polymer Synthesis: Solid phase peptide synthesis, small molecule synthesis, conjugation reactions for modification of commercial polymers, click chemistry (thiol–ene), fragment condensation reactions
Polymer Characterization: Rheology, 1H-NMR
Cell culture and analysis: Mammalian cell culture (tumor associated macrophages, 3T3 fibroblasts, hMSCs), cell viability assays, enzymatic assays (ELISA), immunocytochemistry
Statistics: Minitab software, design of experiments

PUBLICATIONS & PROPOSALS
• AM Hilderbrand, F Stanzione, J Condon, MA LaRue, A Jayaraman, AM Kloxin, “Understanding the impact of non-natural amino acid incorporation on the assembly of multifunctional collagen mimetic peptides,” *In preparation.*


**PRESENTATIONS & AWARDS:** (Presenter underlined)


• AM Hilderbrand, C Guo, AM Kloxin, “Designing multifunctional collagen mimetic peptides to incorporate hierarchical structure within robust hydrogel materials,” University of Delaware Chemical & Biomolecular Engineering Department’s Annual Winter Research Review, January 2017, Newark DE. *Oral Presentation.*

• M LaRue, AM Hilderbrand, AM Kloxin, “Mimicking the structure of the extracellular matrix using collagen mimetic peptides,” University of Delaware Undergraduate Research and Service Scholar Celebratory Symposium, August 2016, Newark, DE. *Poster.*

• AM Hilderbrand, C Guo, AM Kloxin, “Multifunctional biomaterials with structural complexity,” World Biomaterials Congress, May 2016, Montreal, QC. *Poster.*

• AM Hilderbrand, AM Kloxin, “Biomaterials with multiscale structural complexity,” Delaware IDeAs Meeting, February 2016, Newark, DE. *Poster.*

• AM Hilderbrand, C Guo, AM Kloxin, “Hydrogels with structural complexity provided by multifunctional collagen mimetic peptides,” Neutron day, November 2015, Newark, DE. *Poster.*

• Collins Fellowship (2013-2014)

**MENTORSHIP EXPERIENCE**

• Mark LaRue, Undergraduate Research Assistant, University of Delaware Winter 2016-Present
  o Awards: UD Undergraduate Research Program Summer Fellow 2016 & 2017

• Orlando Walker Jr., K-12 Engineering High School Intern Summer 2017

**LEADERSHIP & COMMUNICATION EXPERIENCE:**

• Founding and Lead Mentor of Empathetic Peers Offering Wisdom Encouragement and Resources (EmPOWER) Program in Department of Chemical & Biomolecular Engineering (2017-Present)

• Fraser and Shirley Russell Teaching Fellowship (Spring 2017)

• President of graduate student organization, Colburn Club (2015-2016)

• DJ for *Science Rocks!*, a weekly radio show on WVUD 91.3 FM The Basement (2014-Present)

• Teaching Assistant for Heat and Mass Transfer Operations (2016) and Introduction to Polymer Science (2014)

**INDUSTRIAL EXPERIENCE:**

**Honeywell Aerospace, Plymouth, MN** May 2011-August 2011

*Engineering Intern*

• Studied process and worked with operators to reduce part scrap and revised Standard Operating Sheets

• Mapped temperatures of heating and cooling block to determine if gradient existed within block
KAO, CHEN-YUAN

15 Innovation Way, Rm 243 Newark, DE 19711 | 302-831-6168 | cykao@udel.edu

Education

2013  Ph.D. Candidate: Chemical and Biomolecular Engineering
- Current  University of Delaware – Newark, DE, USA

2012  Bachelor of Science: Chemical Engineering (GPA: 3.91/4.00)
  National Taiwan University – Taipei, Taiwan

Research Experience

Jan/2014  Graduate Research Assistant
- Current  University of Delaware – Newark, DE  Advisor: Prof. Eleftherios T. Papoutsakis
  - Developed and optimization of a drug/gene delivery system from cell-derived microparticles.
  - Examine the interaction between hematopoietic stem/progenitor cell and megakaryocytic microparticles in vitro.
  - Investigate megakaryocyte maturation and platelet production in vivo & in vitro.
  - Design laboratory-scale bioreactor to enhance platelet production in vitro.

Sep/2010  Undergraduate Research Assistant
- Jun/2012  National Taiwan University – Taipei, Taiwan  Advisor: Prof. Steven Sheng-Shih Wang
  - Examine the mechanism of cataract formation under UV-C light.
  - Purified human gamma-D crystallin from E.coli
  - Investigate the inhibitory effect of resveratrol on human gamma-D crystallin aggregation
  - Examine the effect co-polypeptides on the unfolding of insulin.

Publications


Skills

- Mammalian Cell Culture, Flow Cytometry, Confocal Microscopy, Molecular and Biology Techniques, Transcriptional Analysis (qPCR), Western Blot
Oral Presentation


Poster Presentation

Résumé

CONTACT INFORMATION
Name: Stijn H.S. Koshari
Home address: 311 Harbor Dr Apt 9
Claymont, DE 19703
Office address: 155 Colburn Laboratory
University of Delaware
150 Academy Street
Newark, DE 19716
Phone: +1 (302) 897-1529
Email: StijnKoshari@gmail.com

EDUCATION
- **2014-2018** Ph.D. in Chemical Engineering *(Expected)*
  University of Delaware
  
  **Topic:** Microstructure and stability of dried pharmaceutical protein formulations for application in controlled drug-delivery systems
  *In collaboration with Genentech*
  **Advisors:** Dr. A.M. Lenhoff (UD), Dr. N.J. Wagner (UD)

  **Teaching Assistant Assignment:** Chemical Engineering Laboratory I
  **Teaching Fellow:** Fluid Mechanics

- **2012-2014** Master of Science in Chemical Engineering *(Dual Degree)*
  University of Delaware *(2013-2014)*
  GPA: 4.00
  Katholieke Universiteit Leuven *(2012-2013)*
  *Graduated magna cum laude (83.64%)*

  **Thesis:** ‘Characterization of lysozyme adsorption in cellulosic chromatographic particles using small-angle neutron scattering’
  **Advisors:** Dr. A.M. Lenhoff (UD), Dr. N.J. Wagner (UD), Dr. Y. Liu (NIST)

- **2009-2012** Bachelor of Science in de Ingenieurswetenschappen Optie Chemische Technologie - Materiaalkunde *(Chemical Engineering - Materials Science)*
  Katholieke Universiteit Leuven
  *Graduated magna cum laude (80.89%)*

LANGUAGE SKILLS
Dutch: native
English: fluent
French: basic

MY OBJECTIVE
To obtain a leading role at a global chemical, oil-and-gas, pharmaceutical, or consulting company.
EMPLOYMENT EXPERIENCE

- **ExxonMobil Antwerp Refinery** (Belgium)
  July-August 2012: Summer internship
  *Technical Assistance: Oil Movement and Storage (OM&S)*

- **Genentech Inc.** (South San Francisco, CA)
  June-September 2015: Summer internship
  *Late Stage Pharmaceutical Development (LSPD)*

QUALIFICATIONS

- **Leadership and creativity**
  Student representative during bachelor, master, and Ph.D. studies in official student and university organizations, such as the KUL Educational Committee, the UD Graduate Student Government (GSG), and the UD Faculty Senate. Vice President of Student Affairs in the UD GSG. Board Member and Events Coordinator of the UD Ballroom Dance Team.

- **Engagement and flexibility**
  First participant of the chemical engineering dual-degree program between the University of Delaware and the KU Leuven. Partook in the ATHENS exchange program at ENSTA ParisTech for the course ‘Activities and economy of trade ports’. Co-chair of the GSG Sustainability Committee and founding member and mentor of the new EmPOWER mental health advocacy program at UD.

- **Insight and ambition**
  Excellent academic record. Selected for a Teaching Fellowship in the undergraduate Fluid Mechanics course at UD in 2016. Recipient of the Robert L. Pigford Teaching Assistant Award at UD in 2016. Received the IAR-CIT Master’s Thesis Award for an outstanding master’s thesis at the KUL in 2014.

PUBLICATION HIGHLIGHTS


Christopher P. Long  
University of Delaware  
cplong@udel.edu

EDUCATION

University of Delaware, Newark, DE  
Ph.D., Chemical & Biomolecular Engineering  
GPA: 3.96  
2012-2017

Cornell University, Ithaca, NY  
B.S., Chemical Engineering, Magna Cum Laude  
GPA: 3.92  
2008-2012

RESEARCH & PROFESSIONAL EXPERIENCE

Doctoral Research, University of Delaware  
Advisor: Maciek R. Antoniewicz  
  • Developed new methods for microbial physiological and metabolic characterization, including GC/MS based biomass composition quantification and use of RNA and glycogen for $^{13}$C metabolic flux analysis.  
  • Performed comprehensive physiological and fluxomic characterizations of 45 E. coli central carbon metabolism knockout mutants, identifying novel reactions and patterns of metabolic responses. The results are being applied in the development of ensemble kinetic models.  
  • Characterized metabolic and genetic mechanisms of growth enhancement via adaptive laboratory evolution, in knockout and wild-type strains. Mechanisms of fast growth phenotypes were explored in evolved E. coli and Vibrio natriegens.

Chemistry-Biology Interface Training Program, University of Delaware  
Advisor: Dr. Eleftherios Papoutsakis, “Chromosomal insertion of a heterologous sigma factor in E. coli”  
Advisor: Dr. Thomas Hanson: “Toward Tn-Seq Analysis of Chlorobium tepidum”  
Advisor: Dr. Maciek Antoniewicz: “$^{13}$C-MFA of wild-type E. coli and two knockout mutants”  
2013

Co-op, Chemical Process Design & Commercialization, Merck & Co, Rahway, NJ  
• Evaluated, optimized, and modeled high pressure homogenization as a particle size reduction technique  
• Developed a process for continuous crystallization of an active pharmaceutical ingredient (API)  
2010/2011

Undergraduate Research Assistant, Cornell University, Dept. of Chemical Engineering  
Advisor: Jeff Varner  
• Modeling breast cancer proliferation: literature review, cell signal mapping, simple programming (Spring)  
2010

SKILLS

Experimental  
• Bacterial cell culture  
• $^{13}$C metabolic flux analysis ($^{13}$C-MFA)  
• Isotopic tracer experiment design  
• Gas chromatography/mass spec. (GC/MS) analysis & method development  
• Basic microbiology & cloning techniques

Data Analysis and Computation  
• Isotopic tracer data interpretation  
• Metabolic modeling (COBRA Toolbox)  
• Multivariate statistics with large data sets (eg. PCA, clustering)  
• Matlab, OriginLab, Minitab, Cytoscape, MS Office
**PUBLICATIONS (PRIMARY AUTHORSHIP)**


**Long CP**, Antoniewicz MR. Probing the flexibility and limits of *E. coli* metabolism: Responses to deletion of 20 core enzymes. (2018, submitted)


*equal contribution

**SELECTED PRESENTATIONS**

SIMB Annual Meeting and Exhibition. Denver, CO. August 2017 (Poster)

**Long CP**, Antoniewicz MR. Interrogating central carbon metabolism via $^{13}$C metabolic flux analysis of *Escherichia coli* knockout strains: pathway discovery and model development

Metabolic Engineering XI. Kobe, Japan. June 2016 (Poster)

**Long CP**, Antoniewicz MR. Metabolic Flux Rewiring and Physiology in *E. coli* Upper Central Carbon Metabolism Knockout Strains

Metabolic Engineering X. Vancouver, BC, Canada. June 2014 (Rapid Fire, Poster)

**Long CP**, Antoniewicz MR. Comprehensive study of metabolic flux rewiring in *E. coli* knockout strains

**FELLOWSHIPS AND AWARDS**

University of Delaware Graduate Fellowship 2015-2016
University of Delaware Chemistry-Biology Interface Trainee (NIH Kirschstein Training Grant) 2012-2014
Cornell Tradition Fellowship 2008-2012
National Merit Scholarship 2008-2009
Wesley Luc  
Curriculum Vitae  
University of Delaware | Center for Catalytic Science & Technology  
wlucaudel.edu | +1 858 353 3457

Education
University of Delaware  
Ph.D. in Chemical and Biomolecular Engineering  
(2014 - present)

University of California, San Diego  
M.S. in Chemical Engineering  
Thesis: A Continuous Solar Thermochemical Hydrogen Production Plant Design  
B.S. in Chemical Engineering  
(2010 - 2013)

University of California, Irvine  
B.S. in Chemical Engineering  
(2008 - 2010)

Research and Industrial Experiences
Graduate Research Assistant  
(University of Delaware, January 2014 - present)
Advised by Dr. Feng Jiao  
- Synthesized and characterized state-of-art nanostructured core-shell catalysts for the electrochemical transformation of CO\textsubscript{2} to value-added chemicals  
- Engineered and scaled up electrochemical systems for the development of an advance oxygen recovery system in collaboration with NASA Glenn Research Center  
- Successfully designed a solar-driven electrolyzer and demonstrated one of the highest reported solar-to-fuel efficiency for CO\textsubscript{2} conversion to CO  
- Developed in-situ X-ray adsorption techniques to elucidate catalytic structure of Cu-based electrocatalysts for green hydrogen production and CO\textsubscript{2}/CO\textsubscript{2} electroreduction

Graduate Research Assistant  
(UCSD, September 2012 - June 2013)
Co-advised by Dr. Jan Talbot and Dr. Richard Herz  
- Modeled and performed cost analysis of a new sulfur-ammonia thermochemical water splitting cycle for hydrogen production using Aspen Plus

Solar Hydrogen Team Internship at SAIC (now Leidos)  
(San Diego, June 2011 - June 2013)
Supervised by Project Manager, Robin W. Taylor  
- Synthesized metal oxide electrocatalysts for the oxidation of ammonia sulfite to sulfate

Undergraduate Research Assistant  
(UCI, January 2010 - June 2010)
Advised by Dr. Mikael Nilsson  
- Studied the radiolytic degradation of extracting reagents used in spent nuclear fuel separation processes

Honors and Awards
Bill N. Baron Fellowship Award  
(Institute of Energy Conversion, 2017)
University Doctoral Fellowship Award  
(University of Delaware, 2017)
Richard J. Kokes Travel Award  
(North American Catalysis Society, 2017)
Magna Cum Laude Honors  
(UCSD, 2012)
Dean’s & Provost’s Honors  
(UCSD & UCI, 2012)
Tau Beta Pi: The Engineering Honor Society  
(UCSD, 2011)

Skills and Techniques
Experimental and Characterization Techniques:  
- Electrochemical device testing, CV/RDE studies, XPS, XAS, SEM-EDS, XRD, WDXRF, GC, NMR

Trainings:  
- Cleanroom for nanofabrication, machine shop

Modeling/Numerical Analysis:  
- AspenPLUS, MATLAB, Minitab, CasaXPS, Demeter

Design/Graphics:  
- LabVIEW, AutoCAD, OriginLab, Inkscape
### Publications


### Selected Presentations and Conference Proceedings


### Leadership

**Colburn Chemical Engineering Graduate Club:** University of Delaware
- Vice President (2016 - 2017)
- At-Large Representative (2014 - 2015)

### Teaching Experiences

**University of Delaware**
Teaching Assistant
- CHEG 349: Junior Laboratory (Spring 2016)

**University of California, San Diego**
Teaching Assistant
- CENG 120: Chemical Process Dynamics and Control (Fall 2012)
Stephen J. Ma

(718) 689-4875  |  Stephen.ma89@gmail.com  |  https://www.linkedin.com/in/stephen-ma

Summary

- Chemical engineer with strong background in monomer and polymer synthesis, purification, polymer resin formulation, photochemistry, photopolymerization, thin films, surface chemistry and a variety of characterization techniques
- **Highly self-motivated and self-sufficient with strong time management skills and deadline driven work ethic:** As the first graduate student in the Kloxin lab, set up two new laboratories, established protocols to promote laboratory safety and hygiene, interfaced with vendors to test and purchase instrumentation and equipment, trained new graduate and undergraduate students, independently pursued new research projects in parallel, set deadlines on projects and presentations, and learned new instrumentation
- **Proven ability to work in a collaborative, team-oriented environment:** actively sought and initiated collaborations with other graduate student researchers to explore new research ideas, organized meetings and updates with principle investigators on collaborative projects
- **Excellent verbal and written communication skills:** Awarded NSF Graduate Research Fellowship, Royal DSM Science and Technology Award Americas, Gore Fellow Award (2nd Runner Up), and ACS Excellence in Graduate Polymer Research Award
- **Highly engaged in mentorship and outreach activities:** mentored three undergraduate researchers and many incoming first year graduate students, conducted STEM outreach on geckos feet, thermodynamics and fluid mechanics at local K-12 schools, developed a new peer-support group, EmPOWER, to address graduate student mental health and well-being

Education

- **University of Delaware**
  Ph.D. Candidate in Chemical and Biomolecular Engineering
  (with qualifier commendation)
  Newark, DE
  08/2011 – Present

- **Macauley Honors College at The City College of New York**
  BE in Chemical Engineering, Summa Cum Laude
  NYC, NY
  08/2007 – 06/2011

Research Experience

- **University of Delaware**
  Graduate Research Assistant
  Advised by Prof. Christopher Kloxin and Prof. Norman Wagner
  Newark, DE
  01/2012 - Present

  Control surface interactions (modulus, chemistry and topography) through thiol-ene 'click’ chemistry, focusing on the development of low cost methods to generate wrinkled topography for materials applications. First graduate student in Prof. Kloxin’s research group

  - Created new rapidly curing, low-cost elastomer buckling system through two-tiered polymerization approach (thiol-ene and free radical photopolymerizations)
  - Developed methods to confine and align wrinkle structures using photopolymerizations, resulting in facile formation of gradient wrinkles and photopatterned wrinkled structures
  - Incorporated control over surface chemistry of wrinkled substrates by leveraging oxygen inhibition of free radical polymerization, allowing post-functionalization of unreacted acrylate moieties at the wrinkle surface
  - Initiated a collaboration with a biomaterials research group to determine efficacy of surface functionalization protocol on human mesenchymal stem cell adhesion and alignment
  - Employed flowcoating processes to develop polymer thin films for wrinkle systems with tunable skin moduli and sub-micron wrinkle wavelengths

- **State Key Laboratory of Supramolecular Structure and Materials**
  Undergraduate Research Assistant
  Advised by Prof. Bing Zhao and Prof. John R. Lombardi
  Changchun, China
  06/2010 - 08/2010
International Research and Education in Engineering (IREE) program funded by the National Science Foundation (NSF) and organized by Purdue University. Conducted Raman Spectroscopy on semiconductor nanoparticles to find suitable substrates for Surface-Enhanced Raman Spectroscopy (SERS)

- Discovered enhancement in Raman spectroscopic signal of nanosized semiconductor particles with adsorbed molecules

**Laboratory for Nanoparticle Modification and Assembly**

New York City, NY

*Undergraduate Research Assistant*

Advised by Prof. Ilona Kretzschmar

Improved the efficiency of Dye-Sensitized Solar Cells (DSSC) by creating ordered inverse opal TiO$_2$ structures using monodisperse self-assembled polystyrene templates

- Developed an efficient and reproducible method for self-assembled porous templates using electrodeposition of 5 μm polystyrene particles

**Honors and Awards**

- National Science Foundation I-Corps Sites (U. of Delaware) 02/2017-05/2017
- Royal DSM Science and Technology Award Americas (AIChE 2015) 11/2015
- The Gore Fellows Award (2nd runner up) 12/2014
- ACS Excellence in Graduate Polymer Research Award 03/2014
- Graduate Student Professional Development Award (University of DE) 06/2013
- National Science Foundation Graduate Research Fellowship 06/2012 - 06/2015

**Publications**


**Conference Proceedings**

- **Stephen Ma**, “Shedding Light on Polymer Wrinkles”, American Chemical Society (ACS) National Meeting, August 2016, Philadelphia, PA
- **Stephen Ma**, “Photodirected Control of Topography using Thiol-Ene ‘Click’ Chemistry”, American Institute of Chemical Engineers (AIChE) Fall National Meeting, November 2015, Salt Lake City, UT – *DSM Science and Technology Award Winner*
- **Stephen Ma**, “Photodirected Formation and Control of Wrinkles on a Thiol-ene Elastomer”, American Institute of Chemical Engineers (AIChE) Fall National Meeting, November 2013, San Francisco, CA
- **Stephen Ma**, “Photodirected Formation and Control of Wrinkles on a Thiol-ene Elastomer”, *Excellence in Graduate Polymer Research Symposium*, American Chemical Society (ACS) National Meeting, March 2014, Dallas, TX

**Skills**

<table>
<thead>
<tr>
<th>Monomer/Polymer Synthesis</th>
<th>Dynamic Mechanical Analysis</th>
<th>Optical Microscopy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purification</td>
<td>FTIR Spectroscopy</td>
<td>AFM Microscopy</td>
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<tr>
<td>Resin Formulation</td>
<td>NMR Spectroscopy</td>
<td>Confocal Microscopy</td>
</tr>
<tr>
<td>Photopolymerization</td>
<td>UV-Vis Spectroscopy</td>
<td>Flowcoating</td>
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<tr>
<td>Photolithography</td>
<td>Nano-IR Spectroscopy</td>
<td></td>
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</tbody>
</table>

**Languages**

- English (Native)
- Mandarin Chinese (Conversational)
EDUCATION

University of Delaware, Newark, DE
PhD Candidate in Chemical Engineering (2014-present); Projected Completion: Spring 2019
Coursework GPA: 4.00/4.00
Thesis Advisors: Dr. Yushan Yan, Dr. Bingjun Xu

Tufts University, Medford, MA
Bachelor of Science in Chemical Engineering, Graduation: May 2014
GPA: 3.86/4.00, Dean’s List: Fall 2010 – Spring 2014, Tau Beta Pi – Member 2013
Senior Honors Thesis with High Honors: Novel Quantum Dot-Ionogel Light Emitting Devices and a Determination of the Mechanism for Electroluminescence. Advisor: Dr. Matthew Panzer

RESEARCH EXPERIENCE

University of Delaware – Graduate Research Assistant January 2015 – Present
• Analyzed pH effect on commercial PtRu bimetallic catalyst for the hydrogen oxidation reaction using a rotating disk electrode setup
• Synthesized and performed physical and electrochemical characterizations on nickel and nickel molybdenum catalysts for the hydrogen oxidation reaction
• Tested Ni and NiMo catalysts in hydroxide exchange membrane fuel cells
• Tested Pt, Ir, Pd, and Ru for ammonia production in both a hydroxide exchange membrane and proton exchange membrane electrolyzers
• Tested Cr2N, VN, and Mo2N for ammonia production in proton exchange membrane electrolyzers

Tufts University – Senior Honors Thesis with High Honors September 2013 – May 2014
• Analyzed photoluminescence and electroluminescence spectra to characterize the quantum dot LEDs
• Integrated different ionic liquids into the quantum dot ionic liquid LEDs
• Shaped a hydrogel quantum dot LED by replacing the ionic liquid
• Examined the effect different gases have on the electroluminescence of quantum dot LEDs

Tufts University - Summer Scholar Researcher in GENE Lab June 2012 – August 2012
• Created a novel solid-state LED with quantum dots and ionic liquid gel
• Spin coated different thicknesses of quantum dots to test the effect of thickness on device performance
• Used an atom force microscope to determine quantum dot film thicknesses
• Tested the stability of quantum dot LED

WORK EXPERIENCE

• Developed a budget management and project tracking workbook to improve efficiencies in the daily procedures of the project managers
• Updated foreign material and metal detection systems into a Visio file

The Whitehead Institute - Programming Intern May 2010 – June 2010
• Developed an Excel Database of genes to improve the efficiency of researcher finding relevant genes
• Developed a database used to find gene sections in a group
TEACHING EXPERIENCE

Chemical and Biomolecular Engineering - Teaching Assistant

- **CHEG431: Chemical Process Analysis**
  - September 2015 – December 2015
  - TA in charge of grading/editing homework
  - Organized and led review sessions before exams
  - Received student evaluation average of 4.66 over 4 categories from 51 students

- **CHEG606: Introduction to Catalysis**
  - February 2015 – May 2015
  - TA in charge of grading/editing homework
  - Received student evaluation average of 4.92 over 4 categories from 22 students

SELECTED PRESENTATIONS


PUBLICATIONS


TECHNICAL SKILLS

**Electrochemistry:** Rotating disk electrode (RDE), membrane electrode assembly (MEA) fabrication and testing for fuel cell and electrolyzer applications, two electrode and three electrode analysis techniques

**Synthesis and Characterization:** Scanning electron microscopy (SEM), X-ray diffraction (XRD), raman spectroscopy, thermal gravimetric analysis (TGA), incipient wetness impregnation, hydrothermal synthesis

**Software:** Matlab, Igor, Microsoft Office (Excel, Powerpoint, Word), Aspen, Java

LEADERSHIP AND PROFESSIONAL MEMBERSHIPS

- **Yushan Yan Lab Manager (January 2016 – Present)**
  - Writing standard operating procedures and improving lab safety
  - Maintaining lab equipment
  - Purchasing chemicals and updating the chemical inventory

- **AICHE – Member**
- **ECS – Member**
Research experience

University of Delaware
Newark, DE  Nov 2013–Present
Studying the formation of non-spherical structured emulsions in microfluidic devices, focusing on the assembly of hierarchical superstructures from individual anisotropic droplet building blocks and modifying emulsion droplets with surface-adsorbed and bulk particles. Research focuses strongly on the behavior of colloidal materials and the behavior of liquid interfaces. Mentored undergraduate students working on this and other projects.

University of New South Wales
Sydney, AU  Feb 2017–May 2017
Designed and tested new equipment to create non-spherical aerosol droplets in an international collaboration between University of Delaware and University of New South Wales. Fabricated complete setup including heat transfer units and aerosolization device. Mentored an undergraduate student studying the adsorption characteristics of non-spherical emulsions.

Teaching experience

Teaching assistant, University of New South Wales
Sydney, AU  Apr 2017–May 2017
Developed assignments, exam materials, and tutorial content for “Process Modelling and Analysis” and “Complex Fluid Microstructure and Rheology” courses. Taught tutorial lectures involving demonstrations and review materials.

Teaching assistant, University of Delaware
Newark, DE  Aug 2014–Dec 2014
Teaching assistant for 92 students in Process Control and Dynamics course. Planned and led weekly lectures in computer lab sections. Graded homework and lab assignments from lecture and computer lab. Held independent office hours.

Gymnastics coach
Gymnastika, Arvada, CO  Nov 2010–Jun 2013
The Sundance Studio, Monument, CO  Sep 2006–May 2010
Coached level 4, 5, and 6 team boys—intermediate, competitive levels—and recreational students in gymnastics and developed team skills and leadership abilities. Trained students of varying mental and physical ability, including handicapped children.

2009—level 4 boys won 1st in USA Gymnastics (USAG)—governing body for gymnastics in the United States—state competition, level 5 boys placed 3rd.

2009—level 4 boys won 3rd in USAG state competition.

Honors and affiliations

International Summit of the MRS University Chapters on Sustainability and Nanotechnology poster session poster award  Nov 2017
Langmuir student poster award, 91st ACS CSSS  Jul 2017
Langmuir student poster award, 90th ACS CSSS  Jun 2016
87th Society of Rheology annual meeting poster competition, 3rd  Oct 2015
Robert L. Pigford Teaching Assistant Award  May 2015
American Chemical Society, Colloids Division member  Jan 2015–Present
Society of Rheology member  Oct 2014–Present
Outstanding Graduating Senior, chemical engineering  May 2013
Tau Beta Pi engineering honor society member  Oct 2011–Present
Anton Pegis and President’s scholarships  Aug 2010–May 2013
Publications


Presentations

- **T. A. Prileszky** and E. M. Furst, "Endoskeletal droplets as anisotropic interfaces," University of Delaware Chemical Engineering Winter Research Review, Jan 25, 2017, Newark, DE.

Posters

- **T. A. Prileszky** and E. M. Furst, “Modifying shaped emulsions with magnetic nanoparticles,” 2017 *MRS Fall meeting*, Nov 26–Dec 1, 2017, Boston, MA.*
- **T. A. Prileszky** and E. M. Furst, “Magnetically functionalized endoskeletal droplets,” 90th ACS CSSS, Jun 5–8, 2016, Cambridge, MA.*

Activities

- Collaborated with students, researchers, and faculty at University of New South Wales.
- Participated in educational outreach events while at University of Delaware including science demonstrations at museums and engineering summer camps.
- Three-year elected Colburn Club representative and vice president, planned and conducted department-wide events including graduate recruiting, happy hours, and picnics.
- Performed service for Tau Beta Pi while attending Colorado School of Mines including judging LEGO FIRST competitions, organization recruiting, and campus event planning.
- Performed cheerleading at Colorado School of Mines from 2010–2011 and participated in fundraising and community outreach.

Contact

334 E Main Street, Apt L7
Newark, DE 19711
(719) 641-9640
tamasprileszky@gmail.com

Tamás A. Prileszky
ANDREW R. SWARTZ  
1207 South 2nd Street #3 • Philadelphia, PA 19146 • 215.237.1947 (cell) • arswartz@udel.edu

OBJECTIVE

Seeking to apply my knowledge and experience of pharmaceutical drug development to collaborate in bringing new therapeutics to market that benefit global human health and improve quality of life

EDUCATION

UNIVERSITY OF DELAWARE  
Ph.D. Candidate in Chemical and Biomolecular Engineering  
NEWARK, DE  
2014 – 2018 (expected)

• Overall GPA: 3.6/4.0
• Thesis Advisor: Dr. Wilfred Chen; Thesis Committee: Dr. Abraham Lenhoff, Dr. Christopher Roberts
• Thesis Topic: Enhanced affinity capture and precipitation of antibodies through crosslinking with functionalized protein nanocages

LEHIGH UNIVERSITY  
Masters of Engineering in Biological Chemical Engineering  
BETHLEHEM, PA  
2011 - 2014

• Overall GPA: 3.7/4.0
• Distance education student through Merck’s Educational Assistance Program

UNIVERSITY OF ROCHESTER  
Bachelors of Science in Chemical Engineering  
ROCHESTER, NY  
2007 - 2011

• Overall GPA: 3.6/4.0, Engineering GPA: 3.8/4.0
• Thesis Project: Biobutanol recovery from a mock fermentation broth using a continuous packed tower gas stripping system
• Graduated with High Distinction; Dean’s List; Dean’s Scholarship; AIChE and ACS Member; Sigma Chi Fraternity

INDUSTRY AND RESEARCH EXPERIENCE

UNIVERSITY OF DELAWARE  
Wilfred Chen Laboratory Graduate Research Assistant  
NEWARK, DE  
2014 - present

• Developed and characterized an affinity precipitation purification process for mAbs and Fc-fusion proteins
• Enhanced elastin-like polypeptide aggregation by conjugating Z-domain-ELP fusions to a self-assembled E2 protein nanocage
• Demonstrated spontaneous affinity capture and precipitation through multi-valent antibody binding and nanoparticle crosslinking
• Compared enzymatic Sortase A ligation with isopeptide Spytag/Spycatcher conjugation to maximize Z-ELP-E2 surface density
• Evaluated DNA hybridization-induced nanoparticle crosslinking and dissolution with toehold mediated DNA strand displacement
• Teaching assistant for biophysical characterization laboratory; supervised HIC, DLS, SLS, DSC, and SDS-PAGE experiments

BRISTOL-MYERS SQUIBB COMPANY  
Biologics Process Development Graduate Co-op  
DEVENS, MA  
July-December 2016

• Optimized a nanocage affinity precipitation mAb purification process using four industrial mAbs and one Fc-fusion protein
• Obtained >95% mAb precipitation yield for all molecules from cell culture at ambient temperature without the addition of salt
• Generated a model to describe the crosslinking mechanism and investigated the effect of solution pH on aggregation kinetics
• Achieved 3 logs of host cell protein and 4-5+ logs of DNA impurity clearance from the cell culture fluids
• Evaluated nanocage affinity precipitation as an alternative for Protein A chromatography in platform mAb purification
• Developed a cost-effective, facile assay for mAb culture titer using concentration-dependent turbidity after nanocage crosslinking

MERCK & CO., INC.  
Bioprocess Development Engineer  
WEST POINT, PA  
2011 – 2014

• Developed and optimized production processes for several preclinical and early clinical vaccines
• Established novel platform purification strategies for large enveloped viruses using single-use, disposable technologies
• Purification lead for the development, scale up and tech transfer of the GMP PhI clinical manufacture of a Herpesvirus vaccine
• Optimized a robust, high yielding tangential flow filtration based purification process for a highly unstable Paramyxovirus
• Investigated the application of membrane chromatography for purification and analysis of large biomolecules

JOHNSON & JOHNSON PHARMACEUTICAL R&D INC.  
Pharmaceutical Research & Development Intern  
MALVERN, PA  
Summer 2010

• Conducted cell culture experiments using CHO cells for monoclonal antibody production in bioreactors
• Performed various analytical tests using bioanalyzers and HPLC systems
• Presented the experimental results to co-workers and senior management in meetings and poster presentations
• Assembled bioreactors, prepared cell culture media, maintained preculture seed trains, and clarified culture harvest
ANDREW R. SWARTZ
1207 South 2nd Street #3 • Philadelphia, PA 19146 • 215.237.1947 (cell) • arswartz@udel.edu

URS CORPORATION
Environmental Engineering Intern
- Compiled and analyzed monitor well and soil lithology data and researched permeable reactive barriers
- Investigated potential power plant sites using geologic mapping software
- Utilized programs such as BIOSCREEN and Quick Dominico to analyze contaminant plume flow behavior

LABORATORY AND TECHNICAL SKILLS

Laboratory Experience: GMP compliance, aseptic technique, BSL-2 work, scale up, tech transfer, DOE, Six Sigma Yellow Belt

Bioseparation Techniques: Chromatography, Filtration, Centrifugation, Aqueous 2-Phase Extraction, Precipitation/flocculation

Analytical Techniques: HPLC/AKTA systems, Light scattering, Spectroscopy, Calorimetry, SDS-PAGE, ELISA, Western, Bradford

Protein Engineering Techniques: Bacterial and mammalian cell culture, genetic cloning methods, post-translational modifications

Software: Microsoft Excel, Word, PowerPoint, Unicorn, Empower, MATLAB, Minitab, Mathematica, Spotfire and LabVIEW

PUBLICATIONS AND PATENTS


SELECTED PRESENTATIONS


HAO WANG
Department of Chemical & Biomolecular Engineering, University of Delaware
haowang@udel.edu 221 Academy St, 367AD
(302)290-7951 Newark, DE 19716

EDUCATION

University of Delaware, Newark, Delaware, USA Aug. 2014 - Present
Ph.D. candidate in Chemical Engineering
Principal Investigator: Prof. Yushan Yan
Dissertation Topic: Conductive, Selective and Stable Polymeric Membranes for Redox Flow Battery

University of Science and Technology of China, Hefei, Anhui, China Sept. 2010 - Jun. 2014
B.S. in Chemistry
Overall GPA: 3.78 / 4.30; Rank: 5/67

SKILLS

Languages: native speaker of Chinese, fluent in English
Characterization Instruments: ¹H-NMR, ¹³C-NMR, SEM, GC-MS, LC-MS, FTIR, UV, DMA, TGA etc.
Electrochemical Instruments: Arbin battery test station, redox flow battery cell, Solartron electrochemical impedance spectroscopy etc.
Professional Software: MestReNova, Origin, Endnote, ChemBioDraw, Materials Studio, Matlab, Mathematica, AutoCAD, ANSYS CFD (intermediate), Photoshop, VMware Workstation etc.
Programming Languages: C (intermediate)

PUBLICATIONS

- Hao Wang, Xiaoya Ma, Lan Wang, Junhua Wang, Brian Setzler, Keda Hu, Yun Zhao, Yushan Yan, Highly conductive methylated poly(benzimidazolium) and its degradation in all-vanadium redox flow battery. In preparation (Estimated completion: 2018)
- Hao Wang, Junhua Wang, Yun Zhao, Xiaoya Ma, Yushan Yan, Highly conductive and stable phosphonium polybenzimidazole membrane for all-vanadium redox flow batteries. In preparation (Estimated completion: 2018)
- Hao Wang, Junhua Wang, Yun Zhao, Yushan Yan, Investigation and design of oxidation stable anion-exchange membrane for cerium redox flow batteries. In preparation (Estimated completion: 2018)
- Yue Zhao, Hao Wang, Chenxiao Jiang, Liang Wu, Tongwen Xu, Electrodialysis with notched ion exchange membranes: Experimental investigations and computational fluid dynamics simulations. Separation and Purification Technology, 130 (2014), 102-111

RESEARCH EXPERIENCE

Yushan Yan Research Group, UD (PI: Yushan Yan) Dec. 2014 - Present

Dense poly(2,5-benzimidazole) membrane with high conductivity and stability for all-vanadium redox flow batteries
Synthesized poly(2,5-benzimidazole) polymer and cast the membrane from methanesulfonic acid solution
Conducted all-vanadium redox flow battery test with poly(2,5-benzimidazole) membrane

Highly conductive methylated poly(benzimidazolium) and its degradation in all-vanadium redox flow batteries
Synthesized methylated poly(benzimidazolium) polymer from methylation of hexafluoropropylidene polybenzimidazole
Conducted all-vanadium redox flow battery test with methylated poly(benzimidazolium) membrane
Investigated degradation mechanism of methylated poly(benzimidazolium) in all-vanadium redox flow battery

Highly conductive and stable phosphonium polybenzimidazole membrane for all-vanadium redox flow batteries
Demonstrated high conductivity of phosphonium polybenzimidazole membrane in acid environment
Conducted all-vanadium redox flow battery test with phosphonium polybenzimidazole membrane

Investigation and design of oxidation stable anion-exchange membrane for cerium redox flow batteries
Screened commercial polymer backbones for oxidation stability
Synthesized phosphonium polybenzimidazole membrane which met the EERE project requirement
HAO WANG
Department of Chemical & Biomolecular Engineering, University of Delaware

Electrodialysis with Notched Membranes: Experimental Investigation and CFD Simulations
Conducted the electrodialysis test and participated in the CFD simulation of mass transfer
Participated in the manuscript writing
Anionic quaternary ammonium fluorous copolymers bearing thermo-responsive grafts for fuel cells
Participated in the synthesis of QVBC and copolymers
Ionically Cross-Linked Proton Conducting Membranes for Fuel Cells
Participated in the preparation of membranes as well as the IEC and TEM characterizations

Transition-metal Catalyzed Direct Alkylation Reaction
Investigated condition of methylation on aromatic substrate
Transition-metal Catalyzed Benzylolation Reaction via C-H Bond Activation
Investigated benzylolation reaction using Pd catalyst

Nanomaterial Assisted Biochemistry Reactions
Studied basic experiment skills and monitored cell morphology

TEACHING EXPERIENCE
Electrochemical Energy Engineering Nov. 2017
Department of Chemical & Biomolecular Engineering, University of Delaware
Lectured Introduction of Redox Flow Battery to 17 students

Chemical Engineering Lab I, Graduate Teaching Assistant Spring 2017
Department of Chemical & Biomolecular Engineering, University of Delaware
Instructed 3 labs: flow fundamentals, pressure fundamentals, and temperature fundamentals
Graded total of 69 lab reports from 23 groups of 90 undergraduate students

HONORS AND AWARDS
Scholarships
Aegon-industrial Responsibility Scholarship 2013
CAS Scholarship of Dalian Chemical Physics Institute 2012
CAS Scholarship of Li Xun Metal Research Institute 2011
Outstanding Student Scholarship (Grade 3) 2010

Awards
First Prize in National Olympiad of Chemistry in Shandong Province 2009
Second Prize in 17th National Junior High School Applicative Physical Knowledge Contest 2007
First Prize of Junior High School Mathematics Contest in Shandong Province 2006
Third Prize of 10th National Hua Gold Cup Junior Invitational Mathematics Final Contest 2005
Third Prize of 4th National Elementary and Junior High School Art Contest 1999

SERVICE, LEADERSHIP, AND PROFESSIONAL AFFILIATIONS
Poster for Yan research group to new graduate recruits (UD, USA) 2016, 2017
Publicity Agent for department of chemistry (USTC, China) Sept. 2010 - Jan. 2012
Volunteer of the first “Chinese Bridge” Chinese proficiency competition (Qingdao, China) 01 Aug. 2008
Member of Qingdao Hard-pen Calligraphers Association (Qingdao, China) May 2008 - May 2013
Katherine L. Wiley

150 Academy St
Colburn Laboratory 219
Newark, DE 19716
kwiley@udel.edu
(781) 346-5325

EDUCATION

**Ph.D. Candidate in Chemical Engineering, NSF IGERT Fellow**

University of Delaware, Newark, DE
Department of Chemical and Biomolecular Engineering

Fall 2014-present

**B.S. in Chemical Engineering, Magna Cum Laude**

Bucknell University, Lewisburg, PA
Department of Chemical Engineering

Fall 2010-Spring 2014

University of Queensland, Brisbane, Australia (Study abroad)

Spring 2013

RESEARCH EXPERIENCE

**Graduate Research Assistant and NSF IGERT Fellow**

University of Delaware, Department of Chemical and Biomolecular Engineering
Thesis Advisor: Dr. April M. Kloxin

- Developing a 3D synthetic hydrogel extracellular matrix (ECM) mimic to understand cell-ECM interactions and their influence on disease progression
- Synthesizes and characterizes tissue mimetic hydrogel materials for 3D cell encapsulation that are capable of responding to external stimuli during cell culture
- Evaluates cell compatibility of materials, characterizes cell response to 3D cell culture conditions

**Material/Synthetic Skills:** Peptide synthesis, polymer synthesis, organic small molecule synthesis, rheology, dynamic mechanical analysis, mass spectrometry, UV-vis spectrometry, thiol-ene chemistry, HPLC, $^1$H-NMR

**Cell Culture Skills:** Mammalian and bacterial cell culture, 3D cell culture, immunostaining, protein expression and purification

**RESEARCH EXPERIENCE**

**Undergraduate Research Assistant**

Bucknell University, Department of Chemical Engineering
Advisor: Dr. Erin L. Jablonski

- Designed and fabricated milli-scale devices for controlled emulsion formation and separation for efficient liquid-liquid extraction of model dye
- Developed a mathematical model of mass transfer in milli-scale liquid-liquid extraction system

**PROFESSIONAL EXPERIENCE**

**Research Science Intern (International)**

Fraunhofer, Leipzig, Germany
Institute for Cell Therapy and Immunology (IZI) and Institute for Ceramic Technologies and Systems (IKTS)
Advisor: Julianne Pasold

- Developed and evaluated immunobiological test procedures for bioceramic materials for dentistry and endoprosthetics

**Process Engineering Intern**

Corning Incorporated, Corning, NY
Corning Environmental Technologies, Division Engineering

- Designed, executed, analyzed, and presented experiments at the interface of R&D and production
- Six Sigma yellow belt certified

**PUBLICATIONS**

## AWARDS & HONORS

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<thead>
<tr>
<th>Award/Recognition</th>
<th>Institution</th>
<th>Year</th>
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<tbody>
<tr>
<td>NSF IGERT Fellow</td>
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<td>Spring 2015-present</td>
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<tr>
<td>Graduated Magna Cum Laude, Bucknell University</td>
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<td>Spring 2014</td>
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<tr>
<td>Tau Beta Pi Honor Society, Bucknell University</td>
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<td>Inducted Fall 2013</td>
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<tr>
<td>Alpha Lambda Delta Honor Society, Bucknell University</td>
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<td>Inducted Spring 2011</td>
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## TEACHING & COMMUNICATION EXPERIENCE

<table>
<thead>
<tr>
<th>Position/Experience</th>
<th>Institution</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Radio Show Host and Director</td>
<td>Rise and Science (93.1 WVUD), Newark, DE</td>
<td>Spring 2016-present</td>
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<tr>
<td></td>
<td>University of Delaware, Department of Chemical and Biomolecular Engineering</td>
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<tr>
<td>English Teacher (International)</td>
<td>One. School of English, Torroella de Montgrí, Spain</td>
<td>Summer 2014</td>
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<td>Teaching Assistant for Chemical Engineering Principles, Engineering Athletics, Materials Science</td>
<td>Spring 2012-Fall 2013</td>
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<tr>
<td></td>
<td>Bucknell University, Department of Chemical Engineering</td>
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<td></td>
<td>Instructor for ‘Edible Science’</td>
<td>Summer 2013</td>
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<td>SEA Summer Children’s Program, Salem State University, Salem, MA</td>
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## TEACHING EXPERIENCE

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<tr>
<th>Position/Experience</th>
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<tbody>
<tr>
<td>4th Year Representative, Colburn Club, University of Delaware</td>
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<td>Fall 2017-present</td>
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<td></td>
<td>Student organizer of chemical engineering graduate student recruitment</td>
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<td>Plans and runs various social, academic, and professional development events</td>
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<tr>
<td>Secretary, AIChE Student Chapter, Bucknell University</td>
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<td>Fall 2013-Spring 2014</td>
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<td></td>
<td>Assisted in preparation for student travel to conferences and events</td>
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<td>Served as liaison between undergraduate students and faculty</td>
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<tr>
<td>Social Chair, Tau Beta Pi Student Chapter, Bucknell University</td>
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<td>Fall 2013-Spring 2014</td>
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<td></td>
<td>Planned and oversaw annual Tau Beta Pi student-faculty dinner</td>
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## LEADERSHIP EXPERIENCE

<table>
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<tr>
<th>Position/Experience</th>
<th>Institution</th>
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<tr>
<td>Colburn Outreach Committee (founding member), University of Delaware</td>
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<td>Spring 2015-present</td>
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<tr>
<td>Ballroom Dance Team Member, University of Delaware</td>
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<td>Spring 2015-Fall 2016</td>
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<tr>
<td>Science Night Volunteer, Sussex County, DE</td>
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<td>Spring 2015</td>
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## PRESENTATIONS & SEMINARS (presenters bolded)

**Oral presentations:**

KL Wiley, “Life as a PhD student in chemical engineering,” Department of Chemical Engineering, Bucknell University, April 2017, Lewisburg, PA. **Invited.**

**Poster presentations:**


## VOLUNTEER EXPERIENCE & EXTRACURRICULAR ACTIVITIES

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<th>Position/Activity</th>
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